

Response Under 37 CFR 1.116
Expedited Procedure
Examining Group 1700
Application No. 09/777,603
Amendment dated April 27, 2004
In Reply to Office Action dated February 27, 2004
Attorney Docket No. 3576-010027

REMARKS/ARGUMENTS

Claims 1-35 are cancelled and are replaced by claims 36-53.

The present invention relates to the field of water purification using activated carbon. The particular invention is the control of pH during start-up of a water treatment process by using an activated carbon composition onto which a carboxylic acid is adsorbed. In start-up of a water treatment process, the carboxylic acid of the activated carbon composition is adsorbed on the activated carbon. As the water containing impurities, such as organic acids, passes over the activated carbon composition, the adsorbed carboxylic acid is continually replaced by acids in the water to be purified. This continual replacement of acids ensures that the pH of the purified water remains relatively stable, i.e., within one pH unit. While an activated carbon without adsorbed carboxylic acids would remove organic acids from water, the pH would normally rise during treatment as the quantity of acids in the water being purified is reduced. Applicants have developed a process for avoiding such undesirable increase in pH, namely by providing an activated carbon composition containing a carboxylic acid which is continually replaced by acids in the water being treated to stabilize pH during start-up.

New claims are presented here to more particularly point out the invention. Claims 36-44 are directed to a process for purifying water using an activated carbon composition where the improvement resides in controlling the pH of the purified water during start-up of the process. Claims 45-53 are directed to a method of controlling the pH of water purified by contact with activated carbon composition during start-up. Support for independent claims 36 and 45 can be found at least at paragraphs 0012 and 0013. Dependent claims 37-44 and 46-52 parallel cancelled claims 18-22, 25, and 32-35. New claim 53 is supported at least by paragraph 0019. No new matter has been added.

In the February 27, 2004 Office Action, claims 17, 18, 22, 32 and 33 were rejected under 35 U.S.C. § 102(b) for anticipation by U.S. Patent No. 4,789,475 to Harte et al. Claim 19 was rejected under 35 U.S.C. § 103(a) for obviousness over Harte in view of U.S. Patent No. 5,437,845 to Brioni et al. Claims 20, 21, 23, 25, 34 and 35 were rejected under 35 U.S.C. § 103(a) for obviousness over Harte in view of U.S. Patent No. 6,436,294 to

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Lundquist. The basis for these rejections is that the Harte patent teaches a process for removing heavy metals from water by using an activated carbon composition that includes chelating agents thereon, the chelating agents having some acid functionality. The Brioni patent is relied upon for disclosing carbon sources to produce activated carbon. The Lundquist patent is relied upon for supposedly describing the equivalence of the acid functional chelating agents of Harte with particular simple carboxylic acids.

These rejections are not applicable to new claims 36-53 for the following reasons.

The Harte patent only considers the use of chelating agents for removing heavy metals from contaminated water. There is no consideration given to the need to control pH during the start-up of a water treatment process. The prime goal of the Harte process is to remove metals from drinking water. Chelating agents are adsorbed onto a bed of activated carbon to bind heavy metals in contaminated water to the bed. Any acid functionality of the chelating agents, such as on EDTA or DMS, serves to complex heavy metals. For example, it is well known that EDTA binds to metals by forming six bonds to a metal -- two from nitrogen atoms in amino groups and four from oxygen atoms in carboxyl groups. The acid functionality does not serve to control pH and cannot control pH when it is complexed with metals.

New claims 36-53 require a process of controlling pH. The Harte patent fails to teach any such process. It only teaches removal of heavy metals by chelation. Therefore, claims 36-53 are novel thereover.

In addition, there is no motivation in the Harte patent to practice the invention recited in claims 36-53, i.e., to control pH of water purified using an activated carbon composition. The Harte patent is solely concerned with removing heavy metals from contaminated water. The particular need solved by the present invention is not identified or even considered in the Harte patent.

The secondary references do not account for the deficiencies of the Harte patent. In the absence of some motivation in Harte to practice a method of controlling pH in a water treatment process using an activated carbon composition, the teachings of the Brioni and Lundquist patents are not combinable therewith. As noted above, Brioni adds nothing

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beyond teaching carbon sources for producing activated carbon. The asserted opportunity to substitute the chelating agents of Harte with the acids of Lundquist does not make such a combination of teachings appropriate in the absence of some motivation to do so. MPEP 2143. As is true for Harte, Lundquist is concerned with sorption of heavy metals. Lundquist discloses a process for modifying a medium that includes treating a medium having a metal ion sorption capacity with a solution that includes an agent capable of forming a complex with metals to create a medium having an increased capacity to sorb metal ions relative to the untreated medium. Nowhere in Lundquist is there any consideration given to a need for controlling pH at the start-up of a water treatment process. The “ability” to combine the teachings of Harte and Lundquist does not affect the patentability of the present claims directed to controlling pH at the start-up of a water treatment process which is not even considered by either reference.

While Lundquist discloses useful complexing agents that have more than one carboxyl group, such as citric acid, tartaric acid, oxalic acid, succinic acid, malonic acid, and EDTA, this does not mean that those components are equivalent chelating agents. Lundquist only teaches that EDTA and citric acid are two compounds containing more than one carboxylic acid group that can be used in that specific process. There is no disclosure suggesting that citric acid could be adsorbed onto activated carbon and prevent pH excursions as in the present invention, therefore, a *prima facie* case of obviousness has not been established.

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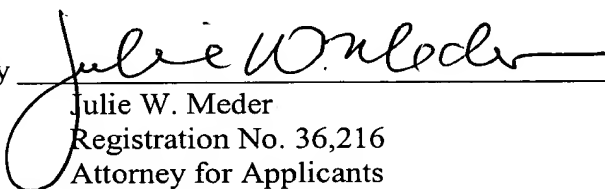
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For all of the reasons stated above, the rejections under 35 U.S.C. §§ 102(b) and 103(a) are not applicable to new claims 36-53. Claims 36-53 are believed to define over the prior art of record and be in condition for allowance.

Respectfully submitted,

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